

Building 29N Treatment Process Overview

The B29N facility is a central oil/water separation treatment for all known or suspected oily and fuel-laden wastewater discharges from engine test cells and support functions in the B29 corridor at the Northwest corner of the site. This facility removes grease, oil, fuel, other petroleum derivatives and settleable contaminants from the wastewater to a level acceptable for discharge to the Lynn Water and Sewer Commission (LWSC) POTW at the Western Avenue Outfall.

Wastewater discharge from engine test cells is primarily the result of cell wash downs after a test sequence has been completed and the engine has been removed. During the test small quantities of jet fuel, lubricating oils, and hydraulic and calibration fluids accumulate in the cell resulting from engine leaks, blown gaskets, fuel line failure and from spills related to filling or tipping the engine. Between engine tests, the cell is thoroughly cleaned and all oily wash water is discharged through the floor drains to a dedicated underground system, which transports the wastewater to B29N for treatment.

The treatment process includes an equalization tank (sub-grade and under the building), three wastewater transfer pumps, and two oil/water separators operating in parallel (each receiving approximately half of the total influent flow). A polishing unit (not required by permit) was voluntarily added to the system, consisting of a series of simple filtering devices.

The design capacity of the current major 29N WTF equipment is as follows:

- ◆ **Wastewater Collection Sump** - Wastewater flows to a 40 ft L x 40 ft W x 10 ft H sump (119,700 gallons) located under Building 29N. Pump level controls are currently set so only the lowest trough/pit portion of the sump remains submerged. The trough (14 ft L x 4 ft W x 2 to 2.5 ft deep = 1,050 gallons) and connected pit (3 ft L x 4 ft W x 3.5 ft deep = 314 gallons) represent 1% of the overall sump capacity. Use of only the small trough ensures that wastewater and sludge do not accumulate across the floor of the entire sump area. Solids collection screens are located upstream to prevent foreign objects from entering the sump.
- ◆ **Three Progressive Cavity Pumps** - Wastewater is pumped from the trough/pit to the separators using two pumps (each rated at 50 gpm), operated alternately. A third pump (also rated at 50 gpm) is present as a back-up, but operates only when selected in hand mode. Run time meters are provided on each pump.
- ◆ **Two Oil/Water Separators** - Each Lancy Model 8201, low solids coalescer type separator is rated for a 100-gpm flowrate. Wastewater is pumped to a common header, which splits to the two separators. Treated water flows by gravity to the sewer, while oils and fuels overflow to an oil storage tank.
- ◆ **Oil Storage Tank** – The product collected in the oil storage tank (29N-2T) is pumped out by the waste contractor and shipped off-site for proper disposal. The 58"Ø x 33" tall tank has a 378-gallon capacity and is located within a 423 gallon containment area dike. The tank is inspected weekly by the on-site hazardous waste handling contract to comply with waste oil regulations.
- ◆ **Final Polishing Treatment** – The skid-mounted final treatment of the effluent is provided by a series of oleophilic filtering devices. The objective of this final treatment step is to minimize the concentration of oil and grease in the discharge. The discharge goal is 30% of the oil and grease concentration at the Western Avenue Outfall. This treatment is voluntary and while approved by LWSC, it is not required by the permit. The polishing unit may be removed from the treatment train with the approval of the Shift Supervisor and Water Programs Lead for routine maintenance, including filter bag change outs. The system has been fitted with a final polishing filtration unit. No discharge to the POTW that bypasses the oil-water separators is authorized, under any circumstances. GE requires that all effluent from the OWS be treated by the final polishing unit as a means of significantly reducing the risk of an exceedance. In rare circumstances, bypass of the polishing unit may be authorized by the EHS WPL, for required maintenance.